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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NGUYEN, KIMBINH T

ART UNIT PAPER NUMBER

2671

DATE MAILED: 03/22/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/921,680

Applicant(s)

RITTER, BRADFORD A.

Examiner

Kimbhinh T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-20 are pending in the application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-11, 13-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Peercy et al. (6,163,319).

Claim 1, Peercy et al. discloses representing 3D graphical image as a plurality of graphics primitives each having a plurality of vertices (col. 14, lines 60-67); for each primitive, computing at least two texture coordinate gradient vectors (normal vector N, tangent T vector and binormal vector B); determining a 3D coordinate frame (a local reference frame), wherein using at least two texture coordinate gradient vectors computed for the respective graphics primitive for orienting the 3D coordinate frame (col. 9, lines 47-65); and utilizing at least 3D coordinate frame to determine parameters of a parametric texture mapping function (surface parameterization function $f(u,v)$; col. 10, lines 20-46) .

Claim 2, Peercy et al. discloses evaluating the parametric texture mapping function for rendering (shading an object surface in computer generated image) 3D graphical image (a texture map is a function of the surface parameterization; col. 21, lines 5-10; lines 36-42).

Claim 3, Peercy et al. discloses parametric texture mapping function (lighting function or lighting equation; equation 20) comprises a biquadric polynomial having at least six coefficients (six coefficients: A_m , A_s , S , D_m , S_m and Env ; col. 14, lines 1-20).

Claims 4 and 5, Peercy discloses calculating scalar components for the parametric texture mapping function (col. 10, lines 22-46; lines 50-59; col. 21, lines 33-42); scalar components include lighting scalar components (lighting and viewing vector; col. 26, lines 28-30).

Claims 6 and 7, Peercy et al. discloses 3D coordinate frame is formed by a normal vector, tangent vector, and binormal vector (col. 3, lines 15-19; col. 9, lines 47-56); calculating a first lighting scalar component for parametric texture mapping function as the dot product of a light vector and the tangent vector; and calculating a second lighting scalar component for the parametric texture mapping function as the dot product of the light vector and binormal vector (col. 4, lines 25-36; col. 26, lines 32-43).

Claims 8-10, Peercy et al. discloses computing a first texture coordinate gradient vector that identifies the direction of maximum change along a first texture coordinate (the tangent space perturbed normal vector in surface dependent texture map); and computing a second texture coordinate gradient vector that identifies the direction of maximum change along a second texture coordinate (the tangent space perturbed

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normal vector in surface independent texture map); assigning a computed value to a variable; and utilizing variable in computing each of at least two texture coordinate gradient vectors; using variable as a denominator in calculating linear combination variables that are used in further computing at least two texture coordinate gradient vectors (a linear function of the per-vertex lighting geometry; col. 3, line 46 through col. 4, line 59).

Claim 11, Peercy et al. teaches parametric texture mapping function is a luminance parametric texture mapping function (illumination model: diffuse and specular components; col. 16, lines 46-52; figs. 4B, 11A and 11B).

Claim 13, Peercy et al. teaches graphics primitive comprises a polygon (col. 14, lines 63-65).

Claim 14, Peercy et al. teaches representing 3D object as a plurality of graphics primitives (col. 14, lines 60-67); determining a first vector (lighting vector) from a first vertex of a graphics primitive to a second vertex of graphics primitive; determining a second vector (viewing vector) from the first vertex to a third vertex of the graphics primitive; calculating a first dot product of the first vector by the first vector; calculating a second dot product of the first vector and the second vector; assigning one variable a value derived from at least the first dot product and the second dot product (diffuse and specular components) (col. 4, lines 26-48); computing at least two texture coordinate gradient vectors utilizing at least one variable (normal and tangent vectors N , T), wherein at least two texture coordinate gradient vectors are indicative of orientation of a texture mapped to graphics primitive (the orientation of the tangent plane; col. 9, lines

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47-56); determining a 3D coordinate frame for each vertex of graphics primitive (a reference frame for a surface point $p(u,v)$; col. 10, lines 25-32), wherein determining comprises using at least two texture coordinate gradient vectors for orienting 3D coordinate frame (3D object space (x,y,z) ; (col. 10, lines 21-32); and utilizing at least 3D coordinate frame in mapping the texture to 3D object (col. 10, lines 4-46). **Claim 15**, Peercy et al. teaches mapping texture to 3D object comprises utilizing a parametric texture map function (col. 10, lines 10-19).

Claims 15-20, the rationale provided in the rejection of claims 1, 6, 7, 9 and 10 is incorporated herein. In addition, Peercy et al. teaches a computer system (col. 9, lines 20-35); computer software (col. 19, lines 54-67).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peercy et (6,163,319) in view of Peercy et al. (5,710,876).

Claim 12, Peercy et al. (6,163,319) does not suggest parametric texture mapping function is a red-green-blue (RGB) parametric texture mapping function. However, Peercy et al. (5,710,876) teaches parametric texture mapping function is a red-green-blue (RGB) parametric texture mapping function (col. 5, line 53 through col. 6, line 27). It would have been obvious to one of ordinary skill in the art at the time the

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invention was made to incorporate the color channels (RGB) taught by Peercy into the bump mapping for processing an image using full spectral representation, because it would provide accurate and consistent color renditions for interactive graphics implementations (col. 3, lines 24-26).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kimbinh Nguyen** whose telephone number is **(703) 305-9683**. The examiner can normally be reached **(Monday- Thursday from 7:00 AM to 4:30 PM and alternate Fridays from 7:00 AM to 3:30 PM)**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

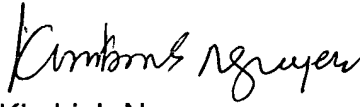
Hand-delivered responses should be brought to Crystal Part II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

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March 16, 2004


Kimbinh Nguyen

Patent Examiner AU 2671